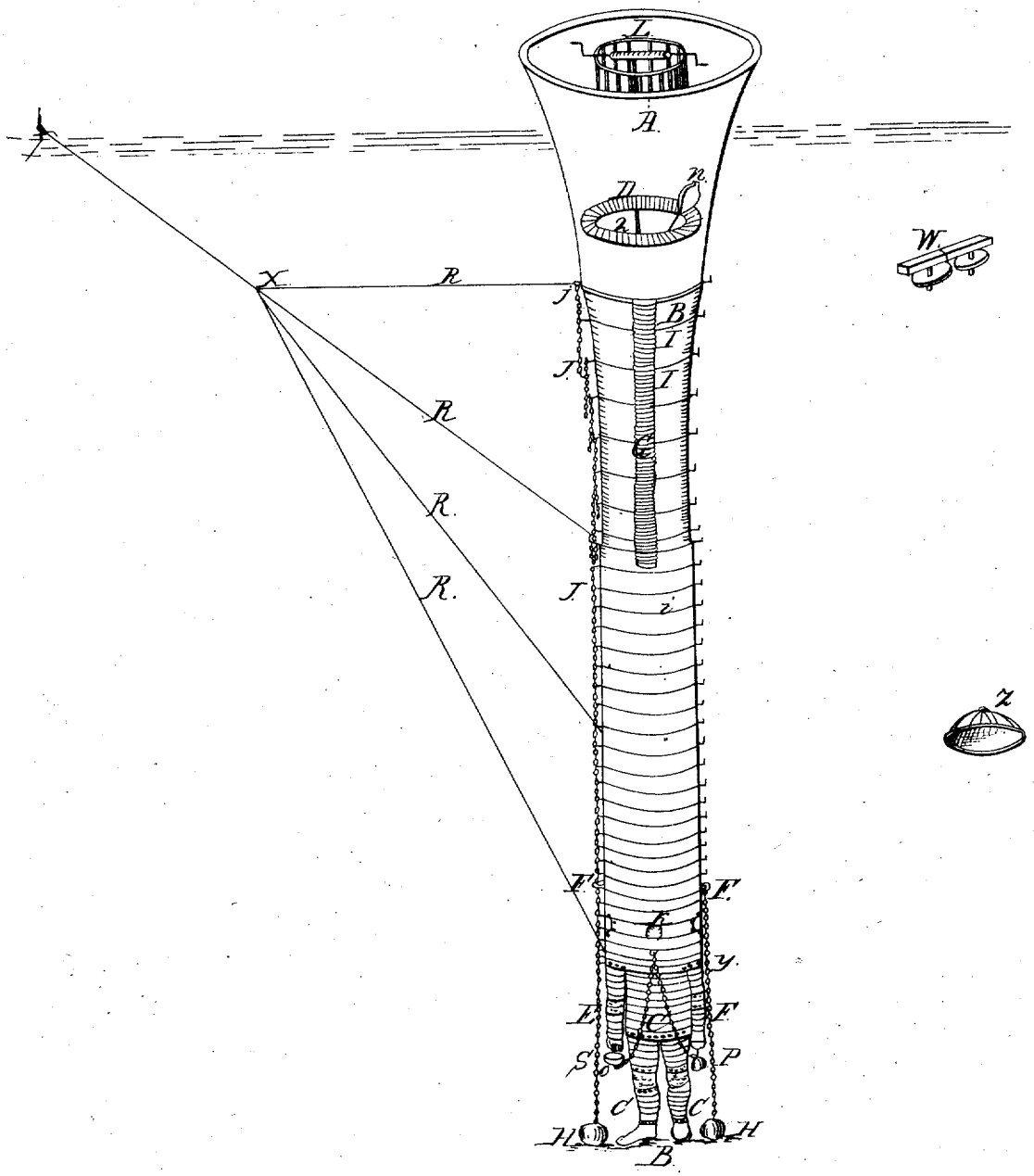
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Short & Bradford.

Diving Armor.

Patented Feb. 18, 1830.



THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

Daniell Short and Noah Bradford of Barnstable Mass

Submarine.

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Daniell Short and Noah Bradford themselves of their improvement the machine for exploring water &c denominated the Submarine Explorer.

To all to whom these presents shall come.

Be it known that We Daniell Short and Noah Bradford both of Barnstable in the County of Barnstable and Commonwealth of Massachusetts have invented a new and useful machine or apparatus for the purpose of exploring sea, coal &c under water and recovering property lost therein which they have denominated the Submarine Explorer. That the following is a full and exact description of the construction and operation of the said machine or apparatus as invented by us. (A Boat or Buoy (A in the drawing hereto annexed) is constructed of Copper (or other suitable materials) in the form of an inverted Bell Mouth'd keg, having sufficient dimension to support the machine and hold the necessary number of men to work it. say five feet diameter at top and three feet diameter at the bottom & five feet in height and covered with leather or other materials) which shall render it impervious to water and also lined with it. To the bottom of this (at B) is attached by screws (or rivets) a tube or hose (B.B.) constructed of leather (or other suitable materials, made water proof and of sufficient thickness to resist the pressure of the water diminishing in size downward from two to five feet. when it is reduced to two feet diameter and of this size continues till within the height of a mans shoulder of the lower end (G.) when two branches (C.F.) resembling somewhat the sleeves of a garment, and fitted to receive a mans arms are attached to it by screws or rivets. said hose continues the same size or nearly the same size to within about three feet of the bottom (b) when it is divided into two parts fitted to receive a mans legs & feet (b.b.) The seams of this hose are secured by screws rivets and the hose is kept extended by means of iron hoops on the inside secured to the covering by screws (or rivets) and increasing downwards in strength and forgiveness in proportion to the increased pressure of the water. To the arms and legs the boots (if boots are used.) are kept in place by iron splints fastened to each by screws or rivets, in which splints a joint is made at the elbow and knee

Daniell Short

to facilitate the motion of the limbs in walking and working. It also to the raising of the arm the inventor has used spiral springs instead of hooks, and thinks them preferable as they admit of great freedom and regularity of motion, and perhaps might be found more convenient for the legs also. The machine is drawn by means of ropes (Fig. 36.) suspended by chains from hooks (F.F.) screwed into a hoop and furnished with a spring to prevent the chains from being easily disengaged. To each it may be necessary or convenient to suspend weights from each of the hooks or ring bolts which are fixed in the hoops inside and outside being three in each hoop outside and perhaps the same inside. To prevent being elevated and depressed by the undulations of the water the hose is contracted by folds for the distance of six feet from the Buoy. so that the Buoy may rise with any ordinary wave without affecting the lower part of the apparatus, and to restore its contraction when the wave subsides, three spiral wires (Fig. G.) of sufficient strength to effect this object without raising the machine are placed on the outside and secured to the hoops by screws resting and extend the distance of six feet downward. To prevent the hose from being confined in any particular part. chains are extended from top to bottom and attached to the said hoops or rings and made to bear equally on all the hoops as high as the spiral wires from which place the Buoy may ascend as not to take effect till the hose becomes extended when they do. and prevent a strain of the hose. About two thirds of the distance from the top to the bottom of the Buoy. there is a platform which was intended to be represented by the figure D. exhibiting a section of the Buoy.) having in its centre an aperture (P.) of the diameter of two feet around which is an iron railing on the left of which is a windlass (L.) on the platform the men who and the operator stand. Thro this aperture the operator descends by stepping on the hoops and carries with him fastened round his body a rope from the windlass and arranges himself in the parts of the bottom adapted to his body and limbs. The windlass and rope facilitate and hasten his ascent in case of sickness or accident. To enable him to see external objects three lights of thick glass (as K.) are put in one in front and one on each side. and set in iron brass or copper frames and screwed to the hose by (screws or) rivets. To enable him to use his hands with ease a piece of leather gloves or mittens are fitted by screws or rivets to the inside of the iron cuffs of the sleeves. As the pressure of the water may check circulation and occasion cold. it will be necessary to use thin and to prevent the pressure of the water from heating

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or the gloves or mittens (each made) (P) (P) are made to screw on the iron cuffs and suspended by chains from hooks or rings in the hoops, with the hand (G) he draws the cap (C) in the arm F then with the remaining hand takes the cap P by a small pistol or handle fixed to the inside, and draws it off the hand and screws it inside. A ring of india rubber is used round the wrist to aid in resisting the pressure of the water, when the hand is in the glove. In case fresh air is required it is supplied by a tube extending from the Buoy to the head of the operator inside and inflated by a bellows (M) (or main pump). To keep the apparatus in a perpendicular position when placed in the tide or current weights or grapnels (K. L. &c.) are fastened to several of the hooks or rings in the hoops having a proper distance (x) and extending to a vessel or other object to which it is secured (of screws are used in fastening the seams they are made with oblong heads an inch in length and placed contiguous to each other. On those inside, circular nuts one inch in diameter are screwed which consequently meet each other and make it perfectly tight). On the upper part however where the spiral wires are placed to facilitate the folding the heads and nuts of the screws are made smaller. An idea of the screws may be obtained from the figure N. The drawing which accompanies this represents an apparatus about eighteen feet in length. but the length may be greater or less according to the depth of the water in which it is intended to work. To enable him to descend to a greater depth than he is moored from the Buoy. In case of any slight leakage thro the apparatus by which the circulation of the operator is rendered bad and uncomfortable. the valve is taken out by a small hydraulic machine in the Buoy. To enable him to descend to a greater depth the apparatus is moored from the Buoy and also from the lower part, just above the head, (at J.) and to protect him from the water a cast iron (or brass cap) (Z) is screwed on in its place at J. To supply him with air a small hose connected with an air pump in the Buoy passes into the apparatus just below the operators head. another similar tube passing thro said cap and screwed into it extends to the Buoy whereby a stop cock the impure air is let off as prudence requires. To enable him to change position, hooks are attached to the several hoops from any of which he may suspend the weights and thus govern any altitude he may wish to assume. To raise him to the sur

fear when required, or else are fastened to as many of the Barks as may be, united
near his head and all reduced to a small Cable in the Buoy. That we claim
as new and for which we ask an exclusive right, is the formation of the float-
ing Boat or Buoy in the form of an inverted Bell or in any other convenient
shape and the attaching thereto a tube of leather or other material made im-
pervious to water and extending from the surface to the bottom of the vessel
and of sufficient dimensions for a person to ascend and descend, and the
furnishing said tube at bottom with the kind of dress or covering above de-
scribed. So that the whole shall form a water tight case or bag in which
respects it differs from all the diving apparatus before known.

In Witness Whereof we have hereunto set our hands and seals this twenty
third day of January A.D. Eighteen Hundred and thirty

Witness
Capt. Timothy Reed
Mr. Hugh Montgomery

Seabell Short
Noah Bradford.

(1665 words)